

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (ORIGINAL) A system for converting solid biomass material to usable heat energy and related byproducts comprising in combination:

an air separator for separating oxygen from air and providing
5 a supply of oxygen,

a solid fuel combustion chamber having a first chamber portion with an airlock inlet feed for feeding a metered amount of solid fuel thereto, said first burner stage having a first traveling conveyor firebelt and means for feeding oxygen from said supply
10 along the length of said first traveling conveyor firebelt,

a second burner stage having a second traveling conveyor firebelt and means for feeding oxygen from said supply along the length of said second traveling conveyor firebelt,

a third burner stage constituting a steam boiler having a
15 firetube for collecting fuel gases from said first burner and said second burner stages and combusting the collected fuel gases with oxygen from said separator and means to generate steam from the heat of combustion in said third burner stage and a heat utilization device connected to said steam boiler.

2. (ORIGINAL) The system defined in claim 1 including means to add a controlled amount of a nitrogen-free diluent gas to oxygen in the combustion chamber and to moderate the burning temperatures to prevent overheating of the refractory and boiler components.

3. (ORIGINAL) The system defined in claim 2 wherein said diluent gas is carbon dioxide from said separator.

4. (CURRENTLY AMENDED) The system defined in claim 3 wherein the amount of said diluent ~~and addition~~ added is controlled by the firetube and boiler temperatures, respectively.

5. (ORIGINAL) A zero emission solid fuel fed combustion system comprising an air separator for separating oxygen from air and providing a supply of oxygen, a solid fuel combustion chamber having a first chamber portion with an airlock inlet feed for feeding a metered amount of a solid fuel thereto, a first burner stage having a first traveling conveyor firebelt, means for feeding oxygen from said supply in progressively increasing proportions along the length of the first traveling conveyor firebelt, a second burner stage having a second traveling conveyor firebelt fed with oxygen from said supply in a progressively decreasing amount along the length of said second traveling conveyor firebelt, a third burner stage constituting a steam boiler having a collector for

collecting fuel gases from said first and second burner stage and
combusting the collected fuel gases with oxygen from said separator
and means to generate steam from the heat of combustion in said
third burner stage, and a utilization device connected to said
steam boiler.

6. (CANCELLED).

7. (CANCELLED).

8. (CURRENTLY AMENDED) ~~The method defined in claim 7~~ In a biomass combustion system for converting biomass to energy and useful products, a combustion method comprising feeding said biomass into a combustion chamber through an airlock and supplying oxygen and a nitrogen-free diluent to said biomass to control the combustion process in said combustion chamber and wherein said nitrogen-free diluent gas is selected from carbon dioxide and argon and mixtures thereof.

9. (CURRENTLY AMENDED) ~~The method defined in claim 7~~ In a biomass combustion system for converting biomass to energy and useful products, a combustion method comprising feeding said biomass into a combustion chamber through an airlock and supplying oxygen and a nitrogen-free diluent to said biomass to control the combustion process in said combustion chamber, including the step

of collecting and passing combustion gas from said combustion chamber through a firetube and adding more oxygen and a diluent gas to control the burning of said combustion gas to produce heat, supplying said heat to a boiler to convert the heat to steam.

10. (ORIGINAL) The method defined in claim 9 including passing residual gases through a cyclone to remove and collect coarse fly-ash and supplying any residual exhaust gas to a baghouse to remove and collect fine fly-ash therefrom and feeding gases from said baghouse to an acid gas scrubber to collect and remove said gas salts, and feeding gases to a carbon dioxide scrubber to remove carbon dioxide therefrom and feeding the carbon dioxide from said carbon dioxide scrubber to a liquifier to liquify carbon dioxide and

feeding said carbon dioxide from said carbon dioxide scrubber to said first combustion stage to as a diluent gas.